

BMJ Open ICU follow-up services and their impact on post-intensive care syndrome: a scoping review protocol

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ABSTRACT

Introduction Post-intensive care syndrome (PICS) seriously affects the quality of life of intensive care unit (ICU) survivors, their ability to return to work and society and the quality of life of their families, increasing overall care costs and healthcare expenditures. ICU follow-up services have important potential to improve PICS. However, the best clinical practice model of ICU follow-up service has not been fully defined and its benefits for ICU survivors are not clear. This review will synthesise and map the current types of follow-up services for ICU survivors and summarise the impact of follow-up services on PICS.

Methods and analysis This scoping review will be conducted by applying the five-stage protocol proposed by Arksey and O'Malley in an updated version of the Joanna Briggs Institute. Eight academic databases including the Cochrane Library, MEDLINE, Web of Science, Embase, EBSCO Academic, CINAHL, PsycInfo and SinoMed (China Biology Medicine) will be systematically searched from inception to the present. Peer-reviewed literature and grey literature will be included. Qualitative, quantitative and mixed methods studies will be included. Studies published in English or Chinese will be included. There will be no time restriction. Two reviewers will screen and select the articles independently and if there is any disagreement, the two reviewers will discuss or invite a third reviewer to make decisions together. Descriptive analysis will be used to conduct an overview of the literature. The results will be presented in a descriptive format in response to the review questions accompanied by the necessary tables or charts.

Ethics and dissemination Ethical approval is not required for this scoping review because data could be obtained by reviewing published primary study results and do not involve human participants. Findings should be disseminated at scientific meetings and published in peer-reviewed journals.

INTRODUCTION

Intensive care unit (ICU) is a specialised hospital facility that provides treatment and monitoring for people who are critically ill and in need of both life-supporting interventions and intensive monitoring by nurses.¹ The ageing population has increased the average age of hospitalised patients and elderly patients have become an important group of ICU patients: Currently, more than half

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This scoping review will employ a rigorous literature search strategy and the review report will follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews framework.
- ⇒ This scoping review will use the Joanna Briggs Institute scoping review guidelines, updated in 2020, as a methodological guidance framework.
- ⇒ The validity or methodological quality of the included studies will not be reported.
- ⇒ In this review, only studies published in English or Chinese will be included; therefore, potentially relevant papers in other languages may have been missed.

of ICU patients are 65 years of age or older.² Increasing expectations from patients, families and other specialised physicians and the increase in conditions considered treatable combined with the rise in obesity and other coexisting conditions make the demand for ICU care likely to grow exponentially.¹ The length of stay (LOS) of ICU patients ranges from 1 day to more than 2 years and is closely related to ICU characteristics.^{3 4} LOS is associated with mortality and a previous study revealed that patients who stay in the ICU for more than 3 days have significantly higher ICU mortality, in-hospital mortality and long-term mortality than patients who stay in the ICU for no more than 3 days.⁵ Medical institutions provide services such as ICU diaries, early mobilisation and rehabilitation during the ICU stay which have a positive impact on ICU patients.^{6 7} In recent years, with the progress of medical treatment and technology, the survival rate of ICU patients has significantly improved.⁸

With the growing need for intensive care and the declining mortality of ICU patients, the number of ICU survivors is increasing. ICU survivors suffer from important functional, psychological and neurocognitive effects and may experience complications that

affect their health-related quality of life.^{9 10} These effects are referred to as post-intensive care syndrome (PICS) which is a new or worsening co-occurrence of physical dysfunctions, psychological disorders, cognitive impairments or failed social reconstruction with these impairments persisting beyond ICU and hospital discharge.¹¹ In a previous study, approximately 60% of patients developed PICS symptoms 6 months after discharge.¹² PICS affects survivors, caregivers and their families, reduces quality of life, reduces their ability to return to work and society, affects their long-term health and increases overall care costs and healthcare expenditures.^{13 14} There is also evidence of complications including depression, anxiety and post-traumatic stress disorder (PTSD) in family members of ICU survivors which has been conceptualised as PICS family.¹⁵ PICS and caregiver stress were identified as significant issues for ICU survivors and their families that require structured services to address and most ICU survivors and families identified follow-up services as beneficial.¹⁶

Follow-up services have been proven to reduce readmission rates and costs and have been widely demonstrated to have a significant effect on elderly patients with chronic diseases such as heart failure, chronic obstructive pulmonary disease and psychiatric disorders.^{17–20} For ICU patients, follow-up services benefit in four ways: continuity of care, recovery information and the possibility of becoming critically ill again, reassurance from experts familiar with ICU experience and the opportunity to provide feedback to ICU staff.²¹ Qualitative studies report that follow-up services can help ICU survivors understand PICS, regain a sense of normality and cope positively.^{10 13} The results of the study revealed that the risk of PTSD was significantly lower in patients who were followed up with.¹³

Existing studies indicate a consensus on the need for follow-up services after ICU admission.^{22–25} The Society of Critical Care Medicine launched the THRIVE post-ICU clinic collaboration in 2017 to improve outcomes for ICU survivors and their families.²⁶ Currently, some countries have established ICU follow-up clinics aiming to provide patients with multidisciplinary observation and follow-up, health consultation, medical guidance, support and other services to help patients recover better and improve the quality and effectiveness of medical treatment.^{24 27} However, follow-up clinics have not been widely carried out globally and have been almost exclusively concentrated in developed countries which have spread mainly to Europe in the last two decades and have gradually spread to North America and Asia in recent years.^{28 29}

There are many types of ICU follow-up including follow-up clinics, home visits, telephone or mail follow-up and telemedicine, however, there is no consensus on the best mode for post-ICU follow-up services.^{22–25} There is a lack of consensus, unified and systematic standards for the operation and management of various types of follow-up services. Taking the ICU follow-up clinic as an example, the existing models differ in team organisational structure

management, intervention focus, follow-up approach, follow-up frequency and duration and eligible patient populations.^{30–32} The latest systematic reviews and meta-analyses show that long-term outcomes for ICU discharge rehabilitation programmes are uncertain partly because of differences in the tools used to measure each domain and the outcomes assessed by each trial, highlighting the need to standardise interventions and measurement outcomes in future trials.^{13 33}

In addition, there is limited evidence from evidence-based studies on the clinical effect of PICS follow-up services. A Cochrane systematic review of four randomised controlled trials and one non-randomised controlled trial reported limited evidence from ICU follow-up studies and that PICS follow-up clinical interventions failed to provide sufficient evidence on whether they were effective in identifying and addressing the unmet health needs of ICU survivors.³⁴ Another systematic review of follow-up counselling in ICU survivors which included five randomised controlled trials reported limited evidence of the efficacy of follow-up counselling after ICU admission and was rated as low quality overall, finding that follow-up counselling did not improve quality of life, anxiety, depression, physical or cognitive function or return to work but it did reduce symptoms of PTSD after ICU admission.¹³ Similarly, another meta-analysis including 13 studies reported that post-ICU follow-up was not effective for depression and anxiety.³⁵ In contrast, a meta-analysis revealed that physical therapy prevented depression and decreased quality of life whereas psychological interventions improved PTSD.³²

There are many types of PICS follow-up and the design and evaluation indicators of various original studies are highly heterogeneous and cannot provide enough evidence-based evidence to support clinical practice. The reference value of the existing evidence-based literature for evidence-based clinical practice is limited. An integrated review reported that little is known about the specific effects of different types of follow-up programmes.²² It is very important to understand what is most helpful for patients and what will produce the greatest benefits.³⁶ Therefore, it is necessary to conduct a scoping review of ICU follow-up services and clarify the types, population, methods, effects on the PICS, evaluation and influencing factors of ICU follow-up services.

OBJECTIVES

The objectives of this scoping review are to explore the current evidence on ICU follow-up services, clarify the impact of these services on PICS and identify research gaps and potential areas for future research.

METHOD

Study design

This scoping review protocol has followed both the Preferred Reporting Items for Systematic review and

Meta-Analysis Protocols (PRISMA-P) checklist³⁷ and the scoping review framework updated by Peters *et al*³⁸ and the Joanna Briggs Institute (JBI)³⁹ on the basis of the framework proposed by Arksey and O'Malley.⁴⁰ The study will follow the following five steps: Identify the research question; identify relevant studies; study selection; charting the data; collating, summarising and reporting the results.

Protocol registration

This protocol was registered in the Open Science Framework on 11 November 2023.⁴¹

Review questions

According to the scope overview section of the JBI manual for evidence synthesis,³⁹ this scoping review uses the Population, Concept, Context (PCC) framework to guide the construction of research questions: P refers to ICU survivors, C refers to follow-up (aftercare) services and C refers to PICS. The research questions of this scoping review were as follows:

Main research questions:

1. What is the current status and implementation of ICU follow-up services?
2. In which countries and regions are ICU follow-up services applied?
3. What is the impact of ICU follow-up services on PICS?
4. What is the data management of ICU follow-up service?

Secondary research questions:

1. Is there a difference in the impact of ICU follow-up services on the PICS for different populations (eg, age, sex, disease type)?
2. What factors can affect the effectiveness of ICU follow-up services?
3. How can the quality and effectiveness of ICU follow-up services be improved?
4. How can the effectiveness and cost-effectiveness of ICU follow-up services be evaluated?

Search strategy

The search terms were initially drawn up according to the PCC framework (ICU survivors, follow-up/after services and PICS), an initial search of MEDLINE through PubMed was conducted to identify relevant keywords and Medical Subject Headings (MeSH) terms and the search strategy was extended. Secondly, text words were included in the title and abstract of the retrieved articles and the index words were used to develop the complete search strategy and the keywords and MeSH terms were adapted for each information source. The search strategy was finally reviewed and refined by a librarian before the formal search. Reference lists of relevant articles and reviews will be evaluated to discover additional relevant studies.

The search will be conducted in the following eight databases comprehensively: The Cochrane Library, MEDLINE, Web of Science, Embase, EBSCO Academic, CINAHL, PsycInfo and SinoMed (China Biology

Medicine). The proposed search strategy for MEDLINE via PubMed is detailed in [table 1](#). A grey literature search will be performed using the following search terms on the Google website as a search engine: Critical/ICU survivors, follow-up/aftercare services and PICS.

Quantitative, qualitative or mixed methodological studies as well as grey literature will be included in this study. No time or language restrictions will be made during search phase.

Eligibility criteria

The inclusion and exclusion criteria of this scoping review were formulated on the basis of the PCC framework (ICU survivors, follow-up/after services and PICS) of this study as well as the proposed research question. The details are listed below.

Inclusion criteria

1. Any types of follow-up services after discharge will be included in this study.
2. Studies published in English or Chinese will be included.
3. Qualitative, quantitative and mixed methods studies will be included.
4. Peer-reviewed literature and grey literature will be included.
5. There will be no time restriction.

Exclusion criteria

1. Studies with no patients (eg, only family members) and studies without follow-up services will be excluded.
2. Studies with insufficient information, incomplete data or obvious analysis errors that could not be included in the analysis will be excluded.
3. Conference abstracts without full texts, study protocols, letters, notices and comments will be excluded.

Study screening

After searching, all identified records will be uploaded to the Covidence online literature management platform. Duplicate studies will be identified and removed. Before formal screening, two reviewers will conduct a pilot test: independently screen titles, abstracts and full texts and review studies for eligibility. Next, two reviewers will conduct two rounds of screening independently: The first round will review the title and abstract and the second round will review the full text according to the eligibility criteria. If there is any disagreement, the two reviewers would discuss or invite a third reviewer to make decisions together. Moreover, the reference lists of the included papers and relevant published reviews will be checked to identify potentially relevant articles. These additional articles will be screened according to the above process. The results of these search processes will be reported in the final scoping review and will be displayed in the PRISMA flowchart.

Table 1 Search strategy for MEDLINE (PubMed)

#	Searches
1	ICU survivor*
2	intensive care survivor*
3	critical care survivor*
4	patients discharged from ICU*
5	patients surviving ICU*
6	survivor*
7	Survivors(MeSH)
8	critical ill*
9	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8
10	Follow-up care*
11	Follow-up service*
12	Follow-up program*
13	Follow-up intervention*
14	Follow-up support*
15	Follow-up clinic*
16	aftercare*
17	aftercare service*
18	aftercare program*
19	aftercare intervention*
20	aftercare support*
21	rehabilitation*
22	recovery center*
23	recovery centre*
24	consultation*
25	rehabilitation N4 ICU
26	consultation N4 ICU
27	post ICU service*
28	post ICU program*
29	post ICU intervention*
30	post ICU support*
31	post ICU rehabilitation*
32	post ICU recovery center*
33	post ICU recovery centre*
34	post ICU consultation*
35	post ICU clinic*
36	Outpatient Clinic*
37	Post-discharge follow-up
38	Follow-Up Studies(MeSH)
39	Aftercare(MeSH)
40	Secondary Care(MeSH)
41	#10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31 OR #32 OR #33 OR #34 OR #35 OR #36 OR #37 OR #38 OR #39 OR #40
42	Post-intensive care syndrome*
43	post intensive care syndrome*
44	PICS
45	post ICU syndrome*
46	post-ICU syndrome*
47	post-ICU consequence*
48	post ICU consequence*

Continued

Table 1 Continued

#	Searches
49	post ICU outcome*
50	post-ICU outcome*
51	post ICU symptom*
52	post-ICU symptom*
53	postintensive care syndrome(Supplementary Concept)
54	#42 OR #43 OR #44 OR #45 OR #46 OR #47 OR #48 OR #49 OR #50 OR #51 OR #52 OR #53
55	#9 AND #41 AND #54

ICU, intensive care unit; MeSH, Medical Subject Headings.

Data extraction

After data screening, two reviewers will perform data extraction via a data extraction form. The data extraction form will be revised by the reviewers on the basis of the JBI standard data extraction form for this study with appropriate modifications and updates during the data extraction process. In the process of data extraction, the theoretical framework of the PICS is used. The definition of PICS in this theoretical framework is 'New or worsening co-occurrence of physical dysfunctions, psychological disorders, cognitive impairments or failed social reconstruction with these impairments persisting beyond ICU and hospital discharge'.¹¹ The data extraction form includes the following: (1) author of the study, (2) year of publication, (3) country/region, (4) aims, (5) study method/design/sample size, (6) basic information of the patients, (7) research context and data analysis method, (8) type and method of follow-up service, (9) PICS and (10) influencing factors of the PICS.

Analysis and presentation of results

For quantitative studies, the research team will summarise the results by concept, population and outcome frequency counts. For the qualitative study, the research team will use NVivo software to perform a qualitative content analysis. The results will be reported in narrative form and necessary tables or charts will be used to summarise the information and organise it according to the review questions. The research team will also engage stakeholders in consultation in this review. Finally, after the data are extracted, organised and summarised, the research team will report the scoping review results according to the PRISMA extension for Scoping Reviews guidelines.⁴² The results would be presented in a manner that is consistent with the objectives of the scoping review.

Data statement

The data and analysis methods generated during the research process (including preprocessing and final analysis codes) would be available from the corresponding author if reasonably requested.

Patient and public involvement

Patients and the public were not involved in this study.

Ethics and dissemination

The study does not require ethical approval because data could be obtained by reviewing published primary research results. The evaluation results will be published in a peer-reviewed journal and will be presented at national and international conferences.

Planned timeline of the review

The literature search began in November 2023 and the review will be completed by the end of 2025.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

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